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ABSTRACT

The Research Services of the National Education Association (NEA) conducted a nationwide teacher opinion poll (TOP) based upon a stratified disproportionate two-state cluster sample of classroom teachers. This research study was conducted to test the hypothesis that the order of presentation of items would make no difference in the conclusions which might be drawn. Five specific issues were assessed on two different forms of the survey. The issues were various aspects of teaching, standardized tests, tuition tax credits, job the President is doing, and influence of special interest groups on governmental policies. The only difference between the forms was the order in which the items were presented to the respondents. Comparisons were made between the opinion responses as well as the demographics of the two groups. Statistically significant differences were found which suggest that position may have an impact on the response distributions. The test forms are reproduced in this document. (Author/DWH)

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ED244991

A Statistical Assessment of Order of Presentation in Multiple Item Likert Scale Survey Responses OR Who's On First?

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The Research Services Division of the National Education Association (NEA) has been conducting a nationwide teacher opinion poll for over 20 years. This research considers the potential impact of changing the order in which opinion items are presented on conclusions which might be drawn for purposes of management decision-making. Five specific issues on the 1983 Teacher Opinion Poll have been assessed on two different forms of the same survey. The only difference in these forms was the order in which selected items were presented to the respondents. Comparisons are made between the opinion responses as well as the demographics of the two groups. Statistically significant differences were found in 28 of the 61 comparisons, at the .10 alpha level, strongly suggesting that position may have an impact on the response distributions.

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"A Statistical Assessment of Order of Presentation in Multiple Item Likert Scale Survey Responses" OR "Who's on First?"

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OBJECTIVE

Research Services of the National Education Association (NEA) has, for more than 20 years, been conducting a nationwide teacher opinion poll (referred to as the TOP). This poll is based upon a stratified disproportionate two-stage cluster sample of classroom teachers in the United States. The NEA includes in its analyses of the findings appropriate standard errors, taking into consideration the nature of the sampling plan.

As in all opinion surveys, criticism can be levelled at the manner in which items on the instrument (particularly volatile items) have been ordered in terms of how the respondents view the sequence and the possible impact on subsequent opinions rendered.

The objective of this empirical research is to examine the order of presentation of specific items, where the order has been varied on two forms of the same instrument, to determine whether the order of presentation does, in fact, make a difference in conclusions which might be drawn.

If we were to have a research hypothesis, it would be that the order of presentation would make no difference in the conclusions which might be drawn.

METHODOLOGY

In April of 1983 two forms of the NEA "Nationwide Teacher Opinion Poll" were mailed to approximately 2,000 teachers from among the more than two million public school teachers in the United States. Two forms of the instrument were developed, being identical except for the order of presentation in five specific areas. In addition, one form was printed in blue on a white background and the other in green on a white background. Respondents were selected for receipt of each survey type randomly from among the final list of teachers to be sampled. As responses were received at NEA Research, instruments were coded so that examination of specific responses would allow for a comparison between the two forms for the five major categories in which the orders were varied.

Approximately 80% of the instruments were returned and were available for analysis. (Slightly more than 100 of the initial 2,000 instruments which were mailed were returned due to an

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inability to locate the respondent or were classified as unusable by criteria established at the beginning of the survey process.)

A brief description of the five major categories follows:

1. Various Aspects of Teaching (Question #3): for this major category the groups (five of them) of similar items are in reverse order, but the items remain in the same order within the groups. (Exhibit 1)
2. Standardized tests (Question #6): for this category, the groups of similar items are in a more mixed order but items within groups maintains the same order. (Exhibit 2)
3. Tuition tax credits (Question #9): there are two major groupings of six items each. The two major groups have been reversed but items within the groups maintain the same order. (Exhibit #3)
4. Job the President is doing (Question #21): the nine specific items are exactly reversed. (Exhibit #4)
5. Influence of special interest groups on governmental policies (Question #23): the eleven specific items are exactly reversed. (Exhibit #5).

It should also be noted that all five questions included Likert scales:

1. a ten point scale
2. a four point scale
3. a ten point scale
4. a four point scale
5. a four point scale with a fifth item ("don't know") included in the analyses.

RESULTS/CONCLUSIONS

Since the analyses centered around comparing the distributions of responses on the two forms for each of the five questions of interest, a chi-square analysis was performed for each item, 61 in all. The information theoretic formula for chi-square was employed:

$$\chi^2 = 2[\, n \ln n + \sum\sum n_{ij} \ln n_{ij} - \sum n_{i.} \ln n_{i.} - \sum n_{.j} \ln n_{.j}]$$

ln is the natural logarithm.

(Kullback, 1959; McCall, 1983)

While the results of each of the specific 61 chi-square computations are not presented in this paper, the summary information follows.

Significance Levels	Question Number #3	#6	#9a	#9b	#21	#23	Totals
.001	2	5		3		4	14
.01	1		1	2	1	1	6
.05	3				1	2	6
.10	1					1	2
.20	3	2	2	1	2		10
>.20	9	3	3		5	3	23
TOTALS	19	10	6	6	9	11	61

Data in the above table indicate the level at which a specific chi-square test was significant. For example, an entry in the row labelled .05 would indicate a significance at the .05 level but not at the .01 level. Entries in the last row are not significant for an alpha of .20.

Needless to say, the results were not what had been expected. The number of significant chi-square values far exceeds what one would expect to find due to chance alone in randomly sampling from populations having the same distributions of responses.

With minor exceptions, the non-significant chi-square values tend to be associated with the items in the middle of the set of items for a specific question.

While we can conjecture as to why these differences have occurred, we refrain from setting forth any positive observations until we have had an opportunity to study the findings further. For example, we had felt that the question with the longer number of sub-items might yield the greatest differences. This was not true, as can be observed on Question #9b, where five of the six items are significant at better than the .01 level.

It is our intention to study other items on the TOP to determine whether the differences observed here tend to follow throughout the survey. This was not observed in the demographics where the two sets of respondents tended to be very similar.

EDUCATIONAL IMPORTANCE OF THE STUDY

Much criticism has been levelled at surveys as a basis for providing decision-making information in education and other fields as well. This criticism (beyond the use of inappropriate sampling and inferential procedures) tends to suggest that wording and ordering of the responses have an impact on conclusions which are drawn and consequent actions taken. It is

felt that the researcher tends to "load" the responses in the direction of indicating "desired" or "expected" results. An advocacy approach and not very scientific.

Although some work of the type initiated in this paper has been done in the field of testing, little appears to have been done related to survey research. It appears reasonable to infer that results found in the testing environment may not be always generalizable to survey research.

This study has examined several highly volatile issues as presented in a nationwide Teacher Opinion Poll. Our findings, taking into consideration several different ways in which to modify the order of presentation within a given question, suggest that order may in fact be important. (Note that the wording of the items has not been considered in this paper, although it is recognized as another significant area in interpreting survey results.)

While our conclusions are not definitive at this stage, we believe we have set the groundwork for further analysis of the subject NEA survey and would hope that others in the field would introduce alternative forms for future analyses.

REFERENCES:

Kullback, Solomon, INFORMATION THEORY AND STATISTICS, John Wiley & Sons, Inc., NY, NY, 1959.

McCall, Chester H., SAMPLING AND STATISTICS HANDBOOK FOR RESEARCH, Iowa State University Press, Ames, Iowa, 1983.

Presented at the American Educational Research Association's Annual Meeting, New Orleans, Louisiana, April 1984.

(PU/89C)

EXHIBIT #1

GREEN FORM

3) Listed below are some phrases that describe various aspects of teaching. Using a scale of *one* to *ten*, with 6 to 10 indicating satisfaction (10 being extremely satisfied), and 5 to 1 indicating dissatisfaction (1 being extremely dissatisfied), please indicate your feeling about each.

a. The salary you receive ..... |__|__|
b. The fringe benefits you receive ..... |__|__|
c. The personal fulfillment you get from teaching ..... |__|__|
d. The flexibility you have in deciding how you teach ..... |__|__|
e. Student behavior in your class(es) ..... |__|__|
f. The procedures used for handling student misbehavior in your school ..... |__|__|
g. The number of students in your class or classes ..... |__|__|
h. The availability of up-to-date textbooks .. |__|__|
i. The availability of teaching supplies ..... |__|__|
j. The amount of clerical help available to you from teacher aides or other support staff ..... |__|__|
k. The support you receive from other teachers in your school ..... |__|__|
l. The support you receive from your principal ..... |__|__|
m. The support you receive from the parents of your students ..... |__|__|
n. The support available to you from teachers' organizations ..... |__|__|
o. The time you spend supervising students outside of class ..... |__|__|
p. The time you spend on school work after working hours ..... |__|__|
q. The amount of time you spend on record keeping and clerical duties ..... |__|__|
r. The quality of the in-service education provided by your school system ..... |__|__|
s. The treatment of education by the media in your community ..... |__|__|

BLUE FORM

3.) Listed below are some phrases that describe various aspects of teaching. Using a scale of *one* to *ten*, with 6 to 10 indicating satisfaction (10 being extremely satisfied), and 5 to 1 indicating dissatisfaction (1 being extremely dissatisfied), please indicate your feeling about each.

a. The treatment of education by the media in your community ..... |__|__|
b. The quality of the in-service education provided by your school system ..... |__|__|
c. The time you spend supervising students outside of class ..... |__|__|
d. The time you spend on school work after working hours ..... |__|__|
e. The amount of time you spend on record keeping and clerical duties ..... |__|__|
f. The support you receive from other teachers in your school ..... |__|__|
g. The support you receive from your principal ..... |__|__|
h. The support you receive from the parents of your students ..... |__|__|
i. The support available to you from teachers' organizations ..... |__|__|
j. The flexibility you have in deciding how you teach ..... |__|__|
k. Student behavior in your class(es) ..... |__|__|
l. The procedures used for handling student misbehavior in your school ..... |__|__|
m. The number of students in your class or classes ..... |__|__|
n. The availability of up-to-date textbooks ... |__|__|
o. The avilability of teaching supplies ..... |__|__|
p. The amount of clerical help available to you from teacher aides or other support staff ..... |__|__|
q. The salary you receive ..... |__|__|
r. The fringe benefits you receive ..... |__|__|
s. The personal fulfillment you get from teaching ..... |__|__|

EXHIBIT #2

BLUE FORM

6. In education, standardized tests may be used in many ways. In your opinion, how appropriate is each use listed below? Use the following scale, circling ONE number of each use:

1 – Very appropriate
2 – Somewhat appropriate
3 – Somewhat inappropriate
4 – Very inappropriate

a. Using student test data to evaluate the effectiveness of schools	1	2	3	4
b. Using student test data to evaluate individual teacher effectiveness	1	2	3	4
c. To determine entry into the teaching profession	1	2	3	4
d. To grant teacher recertification	1	2	3	4
e. The primary measure of student learning	1	2	3	4
f. Diagnosing individual student learning problems	1	2	3	4
g. The basis for grouping or tracking students	1	2	3	4
h. To determine promotion/retention of students	1	2	3	4
i. The primary basis for granting a high school diploma	1	2	3	4
j. The primary basis for determining college admission	1	2	3	4

GREEN FORM

6. In education, standardized tests may be used in many ways. In your opinion, how appropriate is each use listed below? Use the following scale, circling ONE number for each use:

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a. The primary measure of student learning	1	2	3	4
b. Diagnosing individual student learning problems	1	2	3	4
c. The basis for grouping or tracking students	1	2	3	4
d. To determine promotion/retention of students	1	2	3	4
e. The primary basis for granting a high school diploma	1	2	3	4
f. The primary basis for determining college admission	1	2	3	4
g. To determine entry into the teaching profession	1	2	3	4
h. To grant teacher recertification	1	2	3	4
i. Using student test data to evaluate individual teacher effectiveness	1	2	3	4
j. Using student test data to evaluate the effectiveness of schools	1	2	3	4

EXHIBIT #3

BLUE FORM

9. a. Once again, regardless of whether you **personally** support or oppose tuition tax credit legislation, please indicate the relative strength you think **each** of the following statements would have in encouraging voters in the community where you *live* to OPPOSE such legislation. *Use a scale of 1 to 10* with 1 to 5 indicating weakness (1 being VERY WEAK) and 6 to 10 indicating strength (10 being VERY STRONG).

Tuition tax credit legislation would:

- ⌊⌋⌋ 1. Benefit primarily the affluent taxpayer
- ⌊⌋⌋ 2. Encourage the middle class to abandon public schools
- ⌊⌋⌋ 3. Provide federal support to institutions, some of which practice discrimination based on race, sex, physical handicaps, etc.
- ⌊⌋⌋ 4. Violate the constitutional principle of separation of church and state
- ⌊⌋⌋ 5. Be funded through federal funds formerly allocated for public education
- ⌊⌋⌋ 6. Lead to government regulation of nonpublic education

b. Regardless of whether you personally support or oppose tuition tax credit legislation, please indicate the relative strength you think each of the following statements would have in encouraging voters in the community where you *live* to SUPPORT such legislation. *Use a scale of 1 to 10* with 1 to 5 indicating weakness (1 being VERY WEAK) and 6 to 10 indicating strength (10 being VERY STRONG).

Tuition tax credit legislation would:

- ⌊⌋⌋ 1. Ease the "double charge" for tax-paying parents whose children are enrolled in nonpublic schools
- ⌊⌋⌋ 2. Extend the choice of nonpublic education to parents who otherwise could not afford it
- ⌊⌋⌋ 3. Strengthen public education through greater competition with nonpublic schools
- ⌊⌋⌋ 4. Extend assistance to nonpublic schools which they deserve for providing a public service
- ⌊⌋⌋ 5. Support the growth of nonpublic schools whose emphasis is quality education
- ⌊⌋⌋ 6. Extend the choice of nonpublic education to a larger number of students with special needs

GREEN FORM

9. a. Regardless of whether you personally support or oppose tuition tax credit legislation, please indicate the relative strength you think each of the following statements would have in encouraging voters in the community where you *live* to SUPPORT such legislation. *Use a scale of 1 to 10* with 1 to 5 indicating weakness (1 being VERY WEAK) and 6 to 10 indicating strength (10 being VERY STRONG).

Tuition tax credit legislation would:

- ⌊⌋⌋ 1. Ease the "double charge" for tax-paying parents whose children are enrolled in nonpublic schools
- ⌊⌋⌋ 2. Extend the choice of nonpublic education to parents who otherwise could not afford it
- ⌊⌋⌋ 3. Strengthen public education through greater competition with nonpublic schools
- ⌊⌋⌋ 4. Extend assistance to nonpublic schools which they deserve for providing a public service
- ⌊⌋⌋ 5. Support the growth of nonpublic schools whose emphasis is quality education
- ⌊⌋⌋ 6. Extend the choice of nonpublic education to a larger number of students with special needs

b. Once again, regardless of whether you personally support or oppose tuition tax credit legislation, please indicate the relative strength you think each of the following statements would have in encouraging voters in the community where you *live* to OPPOSE such legislation. *Use a scale of 1 to 10* with 1 to 5 indicating weakness (1 being VERY WEAK) and 6 to 10 indicating strength (10 being VERY STRONG).

Tuition tax credit legislation would:

- ⌊⌋⌋ 1. Benefit primarily the affluent taxpayer
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- ⌊⌋⌋ 3. Provide federal support to institutions, some of which practice discrimination based on race, sex, physical handicaps, etc.
- ⌊⌋⌋ 4. Violate the constitutional principle of separation of church and state
- ⌊⌋⌋ 5. Be funded through federal funds formerly allocated for public education
- ⌊⌋⌋ 6. Lead to government regulation of nonpublic education

EXHIBIT #4

BLUE FORM

21. How would you rate the job President Reagan is doing in each of the areas listed below? Circle ONE number for each, using the following scale:

1 – Very good 3 – Poor
2 – Good 4 – Very poor

a. Social services 1 2 3 4
b. Environmental issues 1 2 3 4
c. Inflation 1 2 3 4
d. National defense 1 2 3 4
e. Foreign affairs 1 2 3 4
f. Education 1 2 3 4
g. Unemployment 1 2 3 4
h. Human rights 1 2 3 4
i. Energy 1 2 3 4

GREEN FORM

21. How would you rate the job President Reagan is doing in each of the areas listed below? Circle ONE number for each, using the following scale:

1 – Very good 3 – Poor
2 – Good 4 – Very poor

a. Energy 1 2 3 4
b. Human rights 1 2 3 4
c. Unemployment 1 2 3 4
d. Education 1 2 3 4
e. Foreign affairs 1 2 3 4
f. National defense 1 2 3 4
g. Inflation 1 2 3 4
h. Environmental issues 1 2 3 4
i. Social services 1 2 3 4

EXHIBIT #5

BLUE FORM

23. How much influence do you think each of the following special interest groups has on governmental policies established at the national level? Use the following scale, circling ONE number for each group:

1 – Great influence 3 – Little influence
2 – Moderate influence 4 – No influence
5 – Don't know

a. The National Right-to-Work Committee. 1 2 3 4 5
b. The National Right-to-Life Committee 1 2 3 4 5
c. The National Rifle Association 1 2 3 4 5
d. The National Organization for Women 1 2 3 4 5
e. The National Education Association . 1 2 3 4 5
f. The National Association of Manufacturers 1 2 3 4 5
g. The Moral Majority 1 2 3 4 5
h. The Chamber of Commerce..... 1 2 3 4 5
i. The Business and Industry Political Action Committee..... 1 2 3 4 5
j. The American Federation of Teachers 1 2 3 4 5
k. The AFL-CIO 1 2 3 4 5

GREEN FORM

23. How much influence do you think each of the following special interest groups has on governmental policies established at the national level? Use the following scale, circling ONE number for each group:

1 – Great influence 3 – Little influence
2 – Moderate influence 4 – No influence
5 – Don't know

a. The AFL-CIO 1 2 3 4 5
b. The American Federation of Teachers 1 2 3 4 5
c. The Business and Industry Political Action Committee..... 1 2 3 4 5
d. The Chamber of Commerce..... 1 2 3 4 5
e. The Moral Majority 1 2 3 4 5
f. The National Association of Manufacturers 1 2 3 4 5
g. The National Education Association . 1 2 3 4 5
h. The National Organization for Women 1 2 3 4 5
i. The National Rifle Association 1 2 3 4 5
j. The National Right-to-Life Committee 1 2 3 4 5
k. The National Right-to-Work Committee. 1 2 3 4 5

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Research *September 1983*

TEACHER OPINION POLL DEMOGRAPHIC HIGHLIGHTS

The status information highlighted here was collected in annual surveys of U.S. classroom teachers in 1973, 1978, and 1983. Attitudinal responses on the back are taken from the 1983 survey. Because these data are subject to normal sampling variation, small differences between percentages may not be statistically significant. Percentages do not always total 100.0 percent because of rounding.

U.S. CLASSROOM TEACHERS

	1973	1978	1983
Distribution of teachers by assignment			
Elementary	51%	50%	48%
Middle or junior high	22	18	21
Senior high	28	32	31
Pupil load			
Elementary teachers:			
Number of pupils in class—mean	27	*a*	24
Secondary teachers:			
Number of classes taught per day—mean	5	*a*	3
Number of pupils taught per day—mean	133	*a*	117
Distribution of secondary teachers by subject taught			
Agriculture	*b*	1	1
Art	4	4	3
Business education	5	5	3
English	23	28	21
Foreign language	4	2	3
Health and physical education	9	8	9
Home economics	3	2	4
Industrial arts	5	1	3
Mathematics	13	19	19
Science	13	9	12
Social studies	12	12	12
Music	5	4	6
Special education	4	1	*b*
Driver education	1	*b*	*b*
Vocational	1	2	1
Other	*b*	1	*b*
Number of classroom teachers in school—mean			
All teachers	45	45	43
Elementary	26	26	26
Secondary	63	64	58
Number of pupils enrolled in school—mean			
All teachers	937	847	772
Elementary	591	529	495
Secondary	1,264	1,158	1,040
Highest degree held			
Bachelor's	66	54	48
Master's or six years	33	46	52
Doctor's	*b*	*b*	*b*

	1973	1978	1983
Current annual contract salary—mean			
All teachers	$ 9,835	$13,823	$20,673[c]
Elementary	9,618	13,431	20,205
Secondary	10,038	14,301	21,052
Men	10,636	15,287	22,164
Women	9,370	13,043	19,918
Northeast	11,134	15,239	22,427
Southeast	8,209	11,526	17,474
Middle	10,011	13,790	21,145
West	9,749	15,031	21,835
Teaching experience			
Total years teaching—mean	11	12	15
Total years in present school system—mean	8	9	12
Age of teachers—mean years			
All teachers	37	38	41
Elementary	38	39	41
Secondary	35	38	41
Men	35	37	41
Women	38	39	40
Sex and marital status			
Men	36%	34%	33%
Single, not previously married	6	5	4
Single, previously married	1	2	1
Married	29	27	28
Women	64	66	67
Single, not previously married	14	11	10
Single, previously married	7	10	8
Married	43	45	49
Race			
American Indian/Alaskan Native	*b*	*b*	1
Asian/Pacific Islander	1	1	1
Black	8	8	8
Caucasian	91	91	88
Chicano/Hispano	2[d]	3[d]	2
Political affiliation			
Democrat	38	42	42
Republican	29	22	27
Other	*b*	1	*b*
No party affiliation	33	35	31

[a] Data not available.
[b] Less than 1 percent.
[c] The average classroom teacher salary, 1982-83, as reported in *Estimates of School Statistics* is $20,531.
[d] These respondents also included in one of the above categories.

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SEE REVERSE SIDE

ATTITUDINAL RESPONSES

Quality of public education	Good/ Very good	Poor/ Very poor
All teachers		
Your school	88%	12%
Your school district	82	18

Violence	Percent responding
All teachers	
Property stolen/damaged	28%
Physically attacked	4

Willingness to teach again	Would	Would not
All teachers	58%	42%
Teaching less than 5 years	72	57
Teaching 5 years or more	28	43
Male	51	49
Female	61	39

Computer/terminal availability in schools	Percent responding
All teachers	70%
Elementary	58
Middle/jr. high	74
Senior high	88

Censorship	Percent reporting successful attempts
All teachers	6%

Satisfaction with aspects of teaching	Satisfied
The flexibility you have in deciding how you teach	88%
The personal fulfillment you get from teaching	83
The support you receive from other teachers in your school	80
The availability of up-to-date textbooks	75
The support you receive from your principal	74
The support available to you from teachers' organizations	71
The time you spend supervising students outside of class	68
The availability of teaching supplies	66
Student behavior in your class(es)	66
The number of students in your class or classes	65
The support you receive from the parents of your students	61
The fringe benefits you receive	55
The procedures used for handling student misbehavior in your school	55
The time you spend on school work after working hours	50
The quality of the in-service education provided by your school system	48
The amount of clerical help available to you from teacher aides or other support staff	40
The salary you receive	39
The treatment of education by the media in your community	39
The amount of time you spend on record keeping and clerical duties	34

Reduction-in-force	Percent receiving notice
All teachers	6%

Standardized tests—appropriateness of uses:	Very/ somewhat appropriate
Diagnosing individual student learning problems	77%
The basis for grouping or tracking students	69
To determine entry into the teaching profession	51
The primary basis for determining college admission	50
The primary basis for granting a high school diploma	43
Using student test data to evaluate the effectiveness of schools	42
To determine promotion/retention of students	42
The primary measure of student learning	40
Using student test data to evaluate individual teacher effectiveness	21

Tuition tax credits	Support	Oppose
All teachers	28%	72%

Student misbehavior interferes with teaching	Great/ moderate	Small/ not at all
All teachers	45%	54%
Elementary	50	50
Middle/jr. high	52	48
Senior high	33	67

Job rating for Reagan	Very good/ good	Very poor/ poor
National defense	67%	33%
Inflation	59	41
Foreign affairs	50	50
Energy	46	54
Human rights	44	56
Social services	35	65
Environmental issues	32	68
Unemployment	25	75
Education	23	77